

U.S. Serial No. 10/593,990  
Response to Office Action dated May 10, 2011

Patent  
CU-5127

### **AMENDMENTS TO THE CLAIMS**

The following listing of claims replaces all prior listings of claims.

#### ***Listing of Claims***

1. (currently amended) A microfluidic device comprising:

a microfluidic flow cell; and

a hydrophilic substrate for being removably interfaced with said microfluidic flow cell interfacing with a removable member for performing a reaction therebetween, said substrate providing for analyzing a reaction product thereon, said microfluidic flow cell comprising:

an elongated body defining opposite front and rear ends and opposite lateral sides;

at least one reaction portion formed at least near said front end and defining with ~~the removable member~~ said substrate a reaction chamber when said microfluidic flow cell and said ~~removable member~~ substrate are in an interfaced with each other position thereof;

at least two fluid-receiving portions positioned at least near said rear end for receiving a fluid therein and being in fluid communication with said reaction chamber;

a common channel positioned generally centrally of said elongated body and in fluid communication with said reaction chamber;

at least two separate conduits being in fluid communication with said common channel and extending therefrom towards a respective one of said opposite lateral sides, each said conduit being in fluid communication with a respective one of said at least two fluid-receiving portions; and

a dispensing portion in fluid communication with said reaction chamber, and with the external environment of said

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microfluidic flow cell, said dispensing portion comprising a dispensing channel formed within said microfluidic flow cell;  
wherein when ~~in said interfaced position~~, said microfluidic flow cell and said substrate are interfaced, said microfluidic device is adapted to allow for the fluid in said fluid-receiving portion to flow to said reaction chamber and for excess fluid in said reaction chamber to flow into the external environment via said dispensing portion and wherein when the reaction is completed, said microfluidic flow cell being so removable from said substrate so as to allow the reaction product to remain on said substrate.

2. - 4. (cancelled)

5. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said ~~plurality of separate~~ conduits meet at a valve for fluid communication therewith; said valve being in fluid communication with said common reaction chamber.

6. (cancelled)

7. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said reaction portion comprises a reaction cavity.

8. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 7, wherein said cavity comprises a structure selected from the group consisting of indentations and at least one groove.

9. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said fluid-receiving portion comprises a reagent chamber, said fluid comprising a reagent.

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10. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said fluid-receiving portion comprises a fluid-receiving chamber formed within said microfluidic flow cell.

11. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said fluid-receiving portion comprises a fluid-receiving cavity defining a fluid-receiving chamber with said ~~removable member~~ substrate ~~when said microfluidic flow cell and said removable member are in said interfaced position.~~

12. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[2]]~~ 1, wherein said conduit is formed within said microfluidic flow cell.

13. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[2]]~~ 1, wherein said ~~microfluidic flow cell~~ further ~~comprising~~ comprises a conduit cavity, said conduit-cavity defining said conduit when said microfluidic flow cell and said ~~removable member~~ substrate are in said interfaced position.

14. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[3]]~~ 1, wherein said at least one of said ~~plurality of~~ conduits is formed within said microfluidic flow cell.

15. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[3]]~~ 1, wherein said microfluidic flow cell further comprises at least one conduit cavity, of said plurality of conduits is for defining at least one said conduit when interfaced with said substrate defined by a conduit in said microfluidic flow cell when said microfluidic flow cell and said removable member are in said interfaced position.

16. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 5, wherein said valve is formed within said microfluidic flow cell.

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17. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 5, wherein said microfluidic flow cell further comprising comprises a valve cavity, said valve cavity defining said valve when said microfluidic flow cell and said removable member are in said interfaced position with said substrate.

18. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[6]]~~ 1, where said common channel is formed within said microfluidic flow cell.

19. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 18, wherein said microfluidic flow cell further comprising comprises a common channel-cavity, said common channel-cavity defining said common channel when said microfluidic flow cell and said removable member are in said interfaced position with said substrate.

20. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said microfluidic flow cell further comprising comprises a plurality of separate fluid-receiving portions, each said fluid-receiving portion of said plurality being in fluid communication with a common channel, said common channel being in communication with said reaction chamber.

21. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 20, wherein each said separate fluid-receiving portions comprises a pair of elongate bores meeting at a common part of said common channel.

22. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 21, wherein said common part comprises a valve.

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23. (currently amended) A microfluidic ~~flow cell~~ device according to claim 20, wherein said common channel is formed within said microfluidic flow cell.

24. (currently amended) A microfluidic ~~flow cell~~ device according to claim 20, wherein said microfluidic flow cell further comprising comprises a common channel-cavity, said common channel-cavity defining said common channel when ~~said microfluidic flow cell and said removable member are in said~~ interfaced position with said substrate.

25. (currently amended) A microfluidic ~~flow cell~~ device according to claim 21 wherein said pair of elongate bores are formed within said microfluidic flow cell.

26. (currently amended) A microfluidic ~~flow cell~~ device according to claim 21, wherein said ~~elongate bored bores~~ are formed by complementary elongate bore portions defined by said microfluidic flow cell and said removable member-substrate when in said interfaced with each other position.

27. (currently amended) A microfluidic ~~flow cell~~ device according to claim 22, wherein said valve is formed within said microfluidic flow cell.

28. (currently amended) A microfluidic ~~flow cell~~ device according to claim 22, wherein said microfluidic flow cell further comprising comprises a valve cavity, said valve cavity defining said valve when ~~said microfluidic flow cell and said removable member are in said~~ interfaced position with said substrate.

29. (cancelled)



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30. (currently amended) A microfluidic ~~flow cell~~ device according to claim 1, wherein said dispensing portion comprises a dispensing channel, said microfluidic flow cell further comprising a dispensing channel-cavity, said dispensing channel-cavity defining said dispensing channel when said ~~microfluidic flow cell and said removable member are in said interfaced position~~ with said substrate.

31. (currently amended) A microfluidic ~~flow cell~~ device according to claim 1, wherein said microfluidic flow cell comprises hydrophobic material.

32. (cancelled)

33. (currently amended) A microfluidic ~~flow cell~~ device according to claim ~~[[32]]~~ 1, wherein said ~~substrate~~ microfluidic flow cell comprises elastomeric material.

34. (currently amended) A microfluidic ~~flow cell~~ device according to claim 33, wherein said elastomeric material comprises PDMS.

35.-36. (cancelled)

37. (currently amended) A microfluidic ~~flow cell~~ device according to claim ~~[[35]]~~ 1, wherein said ~~support~~ substrate is functionalized to allow for the binding of probes thereon.

38. (currently amended) A microfluidic ~~flow cell~~ device according to ~~[[35]]~~ 1, wherein said ~~support~~ substrate comprises glass.

39. (currently amended) A microfluidic ~~flow cell~~ device according to claim 1, wherein said ~~support~~ substrate comprises a microarray.

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40. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 39, wherein said microarray comprises bioprobe spots.

41.-46. (cancelled)

47. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1 being adapted to be submitted to centrifugal forces so as to provide for the fluid in said fluid-receiving portion to flow to said reaction chamber.

48. – 49 (cancelled)

50. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said microfluidic flow cell further ~~comprising~~ comprises at least one vent, said vent being in fluid communication with the ambient environment and with said reaction chamber.

51. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said microfluidic flow cell further ~~comprising~~ comprises at least one vent, said vent being in fluid communication with the ambient environment and with said fluid-receiving portion.

52. (currently amended) A microfluidic ~~flow-cell~~ device according to claim ~~[[2]]~~ 1, wherein said microfluidic flow cell further ~~comprising~~ comprises at least one vent, said vent being in fluid communication with the ambient environment and with said conduit.

53. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 5, wherein said microfluidic flow cell further ~~comprising~~ comprises at least one vent, said vent being in fluid communication with the ambient environment and with said valve.

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54. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 18, wherein said microfluidic flow cell further comprising comprises at least one vent, said vent being in fluid communication with the ambient environment and with said common channel.

55. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 20, wherein said microfluidic flow cell further comprising comprises at least one vent, said vent being in fluid communication with the ambient environment and with said common channel.

56. (currently amended) A microfluidic ~~flow-cell~~ device according to claim 1, wherein said microfluidic flow cell further comprising comprises at least one vent, said vent being in fluid communication with the ambient environment and with said dispensing portion.

57.-144. (cancelled)